



COURSE OUTLINE: PHY 106
D Credit – Degree Applicable
COURSE ID 004042
Cyclical Review: March 2019

COURSE DISCIPLINE : PHY

COURSE NUMBER : 106

COURSE TITLE (FULL) : Algebra-based Physics: B

COURSE TITLE (SHORT) : Algebra-based Physics: B

CALIFORNIA STATE UNIVERSITY SYSTEM C-ID : PHYS 110 - Algebra/Trigonometry-Based Physics B

CATALOG DESCRIPTION

PHY 106 is a general course that focuses on the study of light, electricity, magnetism, and modern physics. It includes lectures, demonstrations, problems, and laboratory work.

Total Lecture Units:3.00

Total Laboratory Units: 1.00

Total Course Units: 4.00

Total Lecture Hours:54.00

Total Laboratory Hours: 54.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 108.00

Total Out-of-Class Hours: 108.00

Prerequisite: PHY 105.



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ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	PHY	105	General Physics	Understand basic concepts and laws of mechanics, thermodynamics, and acoustics and apply this understanding to the solution of algebra based problems in these sections of physics;	Yes
2	PHY	105	General Physics	understand the scientific method and apply it to the observations of physical phenomena in mechanics, thermodynamics, and acoustics.	Yes

EXIT STANDARDS

- 1 Calculate the electric field and potential of a charge distribution;
- 2 calculate the electric and magnetic forces on a charged body;
- 3 solve physical problems involving DC and AC currents, and analyze simple circuits;
- 4 apply the principles of geometric optics to mirrors, lenses, and optical instruments;
- 5 solve physical problems involving the wave nature of matter and its applications in modern physics.

STUDENT LEARNING OUTCOMES

- 1 apply physical laws to model real world phenomena
- 2 apply concepts in electricity and magnetism to everyday phenomena, such as lightning, batteries and magnets
- 3 use technology to collect and analyze data

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	Wave Optics <ul style="list-style-type: none"> • Light as a Wave • Interference of Light • Diffraction • Thin Films 	4	0	4
2	Ray Optics <ul style="list-style-type: none"> • Reflection and Refraction • Image Formation • Thin Lenses 	3	0	3



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3	<p>Optical Instruments</p> <ul style="list-style-type: none"> • Cameras • The Human Eye and Vision Correction • Microscopes • Telescopes 	3	0	3
4	<p>Electric Fields and Forces</p> <ul style="list-style-type: none"> • Charge • Coulomb's Law • The Electric Field • Conductors 	3	0	3
5	<p>Electric Potential</p> <ul style="list-style-type: none"> • Voltage and Electric Energy • Connecting Potential and Field • Capacitance and Capacitors 	3	0	3
6	<p>Current and Resistance</p> <ul style="list-style-type: none"> • Conservation of Current • Resistance and Ohm's Law • Energy and Power 	3	0	3
7	<p>Circuits</p> <ul style="list-style-type: none"> • Circuit Elements and Diagrams • Kirchoff's Laws • Series and Parallel Circuits • Electricity in the Nervous System 	3	0	3
8	<p>Magnetic Fields and Forces</p> <ul style="list-style-type: none"> • Magnetic Field of Bar Magnets and the Earth • Magnetic Fields due to Currents • Magnetic Forces and Torques • Magnets 	3	0	3
9	<p>EM Induction and EM Waves</p> <ul style="list-style-type: none"> • Induced Currents • Magnetic Flux and Lenz's Law • Faraday's Law • Light as an Electromagnetic Wave • EM Spectrum 	4	0	4



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10	AC Electricity <ul style="list-style-type: none"> • Transformers • Household Electricity • Biological Effects and Electrical Safety • Oscillation Circuits 	3	0	3
11	Relativity <ul style="list-style-type: none"> • Reference Frames • Simultaneity • Time Dilation • Length Contraction 	3	0	3
12	Quantum Physics <ul style="list-style-type: none"> • X-Ray Diffraction • Photoelectric Effect • Photons • The Uncertainty Principle • Quantization of Energy 	4	0	4
13	Atoms and Molecules <ul style="list-style-type: none"> • Spectroscopy • The Bohr Atom • The Quantum Hydrogen Atom • Molecules 	3	0	3
14	Nuclear Physics <ul style="list-style-type: none"> • Nuclei and Isotopes • Radioactivity and Radiation • Decay and Half-Life 	3	0	3
15	Additional Content, Demonstrations, Classroom Group Work, Exams, and Quizzes	9	0	9
16	Lab	0	54	54
				108

OUT OF CLASS ASSIGNMENTS

- 1 Homework
- 2 Supplemental Instruction (optional)
- 3 Pre-Lecture Reading
- 4 Pre-Lab Reading



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METHODS OF EVALUATION

- 1 Graded Homework (e.g. assigned end-of-chapter textbook problems)
- 2 Quizzes
- 3 Exams/Midterms
- 4 Written laboratory reports for each experiment completed in the laboratory
- 5 Final Exam

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning
- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	ISBN	Date
College Physics, a Strategic Approach	Required	Pearson	4		Knight		2018
Student Workbook for College Physics: A Strategic Approach Volume 2 (Chs 17-30)	Supplemental	Pearson	4		Knight		2018
Lab Manual, Physics 106, Glendale Community College	Required	Glendale Community College			Various		2018